
Roegneria heterophylla, a New Combination for *Roegneria* (Poaceae, Triticeae) from Lebanon

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ABSTRACT. *Agropyron panormitanum* Parlatores var. *heterophyllum* Bornmüller ex Melderis (Poaceae, Triticeae) is transferred to the genus *Roegneria* K. Koch based on its ploidy and genome. The taxon was described from Lebanon and is recognized at species rank as the new combination *R. heterophylla* (Bornmüller ex Melderis) C. Yen, J. L. Yang & B. R. Baum. The taxon is hexaploid, with the StStStStYY genome, and therefore its taxonomic relationship is better reflected and assessed within the genus *Roegneria*, a genus with genomic constitution StStYY or StStStStYY. Furthermore, it should be treated as a new species rather than as a variety because the two have separate and independent gene pools as demonstrated by crossing experiments.

Key words: *Agropyron*, Lebanon, Poaceae, *Roegneria*, Triticeae.

Melderis (1960) described the taxon *Agropyron panormitanum* Parlatores var. *heterophyllum* Bornmüller ex Melderis. Bornmüller is credited for stating that it differs from the typical variety of the species by its narrower leaves, smaller florets (1.2–1.4 mm), two or three well-developed florets per spikelet, and glabrous glumes and shorter anthers (ca. 3 mm). Tzvelev (1970) transferred *A. panormitanum* to *Elymus* L. as *E. panormitanus* (Parlatores) Tzvelev. Although Jensen and Salomon (1995: 731) used the name “*Elymus panormitanus* (Parl.) Tzvelev var. *heterophyllum* Bornm. ex Meld.,” Melderis never treated the species or variety in *Elymus* and the combination was not validly published by Jensen and Salomon (1995). Although they adopted the combination in the form that satisfies Art. 33.1 of the *International Code of Botanical Nomenclature* (McNeill et al., 2006), they failed to provide “a full and direct reference” to the

“author and place of valid publication” of the basionym as required on or after 1 January 1953 under Art. 33.4. However, Salomon had done so earlier (Salomon, 1994), providing the author and place of valid publication of the basionym on page 18 and adopting the name on page 19.

Salomon's treatment (1994: 18–19) of the epithet *heterophyllum* is, however, rather strange. He cited “*Agropyron panormitanum* var. *heterophyllum* Bornm. ex Meld.” as an apparently unqualified synonym of *Elymus panormitanus*, then proceeded to discuss *E. panormitanus* var. *heterophyllum* Bornmüller ex Melderis with clear acceptance of the name, but finally suggested that “it should be treated as a new species rather than a variety.” He did not suggest a name for this species, and there is no suggestion that he was treating *E. panormitanus* as an alternative name for *E. panormitanus* var. *heterophyllum*, and so the name cannot be rejected under Art. 34.2 (McNeill et al., 2006; McNeill, pers. comm.). Indeed, he was evidently accepting *E. panormitanus* var. *heterophyllum* as the current name of the taxon, which, despite the confusing synonymy of the basionym, he clearly considered distinct from *E. panormitanus* var. *panormitanus*, not only noting the differences but excluding specimens of the variety from the morphological description of the species.

Jensen and Salomon (1995) carried out cytogenetic studies in *Agropyron panormitanum* var. *heterophyllum*. They reported that this taxon was hexaploid with 42 somatic chromosomes and possessed the StStStStYY genome and that it crossed with *A. panormitanum* var. *panormitanum*. They also reported that stainable pollen ranged from 5%–10% and averaged 1.3% in the experimental F₁ pentaploid hybrids. Cross-compatibility and fertility between

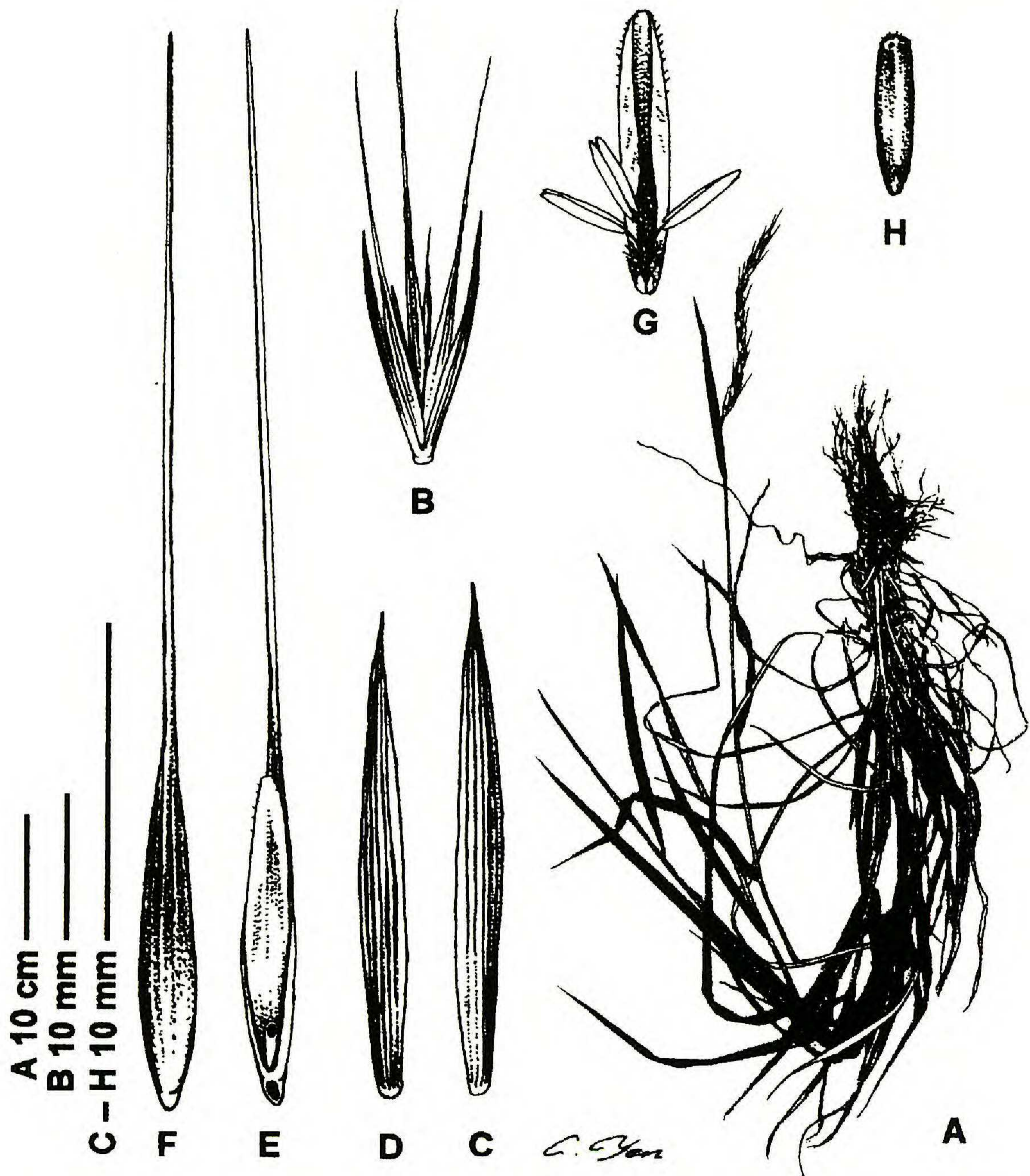


Figure 1. *Roegneria heterophylla* (Bornmüller ex Melderis) C. Yen, J. L. Yang & B. R. Baum. —A. Whole plant. —B. Spikelet. —C. Second glume. —D. First glume. —E. Ventral view of floret. —F. Dorsal view of floret. —G. Palea, lodicules, anthers, and feather-like stigma. —H. Caryopsis. Drawn by C. Yen from a specimen grown from seed accession PI 235086, collected in Israel, received from K. B. Jensen, Logan, Utah, U.S. Department of Agriculture, Agricultural Research Service.

these two taxa are significantly lower than 50%, which suggests that the two taxa have their own independent gene pool (e.g., Kihara, 1982, in regard to wheats). Salomon (1994: 19) correctly considered that “it should be treated as a new species rather than as a variety under *E. panormitanus*. It is derived from [a cross of] *E. panormitanus* and a diploid *Pseudoroegneria* species through inter-generic hybridization.” Unfortunately, he changed his mind the following year (Jensen & Salomon, 1995).

The genomic constitution of this taxon is StStStStYY (Yen et al., 2005) and the foregoing arguments (e.g., independent gene pool) therefore relegate it to species level within the genus *Roegneria* K. Koch. The origin of this taxon is derived from *R. panormitana* (Parlatore) Nevski, StStYY genome, and

an StSt genome donor species of *Pseudoroegneria* (Nevski) Á. Löve. Due to the dominant genetic effect (Jensen & Salomon, 1995) of their parental species, most phenotypic characters of *R. panormitana* and *R. heterophylla* (Bornmüller ex Melderis) C. Yen, J. L. Yang & B. R. Baum are morphologically similar. Therefore, it is difficult morphologically to separate them, but the two can be clearly distinguished by their chromosome number. *Roegneria heterophylla* is a hexaploid taxon ($2n = 6x = 42$), whereas *R. panormitana* is a tetraploid ($2n = 4x = 28$).

Roegneria heterophylla (Bornmüller ex Melderis) C. Yen, J. L. Yang & B. R. Baum, comb. et stat. nov. Basionym: *Agropyron panormitanum* Parlatore var. *heterophyllum* Bornmüller ex Melderis,

K. H. Rechinger f., *Zur Flora von Syrien und Libanon*. Ark. Bot. (Ser. 2) 5: 69. 1960. *Elymus panormitanus* (Parlatore) Tzvelev var. *heterophyllum* (Bornmüller ex Melderis) B. Salomon, *Nordic J. Bot.* 14: 18–19. 1994. TYPE: “Lebanon: Ain Zhalta, reg. subalp., in declivitatibus occ., 1200–1300 m, *Bornmüller 13036*” (holotype, JE not seen; isotypes, BM, G, LD). Figure 1.

Perennial, tufted, without rhizomes; culms erect or geniculate at base, ca. 100 cm, glabrous to densely pilose at upper part of internode, nodes glabrous. Leaf sheaths glabrous or pilose; leaf blades flat, ca. 25 cm × (2.5–)5 mm, scabrous to villous adaxially, abaxially glabrous, scabrous or pilose. Spikes erect or slightly curved, tenuous, 10–16.5 cm, 7 to 11 spikelets per spike, loosely arranged; rachis internodes 10–18 × 1–1.7 mm, glabrous or sparsely scabrous on the back, angles setulose. Spikelets green, narrowly lanceolate, sessile, pressed close to rachis, (12–)15–20 mm (excepted awn), 2 to 3 florets; internode of rachilla setulose and bristly on upper part; glumes subequal, linear-lanceolate or lanceolate, coriaceous, with narrow transparent scabrous margins, lower glumes 16–24 × 1.6–2.5 mm; upper glumes 17–24.5 × 2–2.5 mm, (5 to)7- to 9-nerved, nerves scabrous, adaxially densely puberulous becoming densely pilose near the base of the glumes, tip gradually narrowing into mucro or a ca. 5 mm awn; lemmas narrowly lanceolate, glabrous on back, gradually scabrous on upper part, pubescent near the base, 9–15 × ca. 2 mm, 5-nerved clearly at upper part, (10–)20–32(–35) mm awn; callus sparsely setulose; palea slightly shorter than lemma, tip broadly rounded, ciliate along apical 1/3 from tip of 2 keels; anthers yellow, 3–5 mm.

Cytology. $2n = 6x = 42$, genomic constitution StStStYY.

Distribution. Lebanon (*Bornmüller 13036*, isotypes), Israel (*A. Danin s.n.*, 1 June 1987, J), Syria (*P. Mouterde 10299, 12431, 2648, 7976*, all in G), and other specimens cited in Salomon (1994: 19).

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